

higher land named the Hatteras Flats Interstream Divide. An ocean shoreline, and possibly barrier islands, would have existed on the southeast side of Hatteras Flats at this time (Fig. 2A). By approximately 4,000 years before present (BP), flooding began to occur across the low, southwestern end of the Hatteras Flats Interstream Divide, in the region that is now Ocracoke Island. The flooding of portions of the Neuse and Tar rivers and Pamlico Creek allowed tidal exchange to occur and normal salinity oceanic waters to extend into the southern part of the Pamlico basin (Fig. 2B). Barrier islands formed along the crest of the Hatteras Flats Interstream Divide as it was increasingly drowned by rising sea level. By 2,500 years BP, the barrier islands probably resembled those of today (Fig. 2C).

The southern portion of the Pamlico Sound estuary underwent a rapid and fundamental environmental change during a warm climatic interval known as the Medieval Warm Period. One or more large storms, or a series of smaller storms, struck the southern Outer Banks around 1,100 years BP causing the collapse of a large segment of the barrier. Sand was eroded from the islands and redeposited as a broad, shallow submarine shoal (Fig. 2D). Microfossil data indicate that Gulf Stream waters were transported into the southern Pamlico basin resulting in normal oceanic salinity. Radiocarbon age estimates indicate that the barrier islands were not re-established for approximately 600 years. Indeed, the earliest map drawn by the first English visitors to North Carolina (1590 AD) shows a series of short barrier islands separated by numerous inlets. The majority of these inlets closed during the 17th and 18th centuries leaving a few long, thin barrier islands separating the once more estuarine Pamlico Sound from the Atlantic Ocean (Fig. 1).

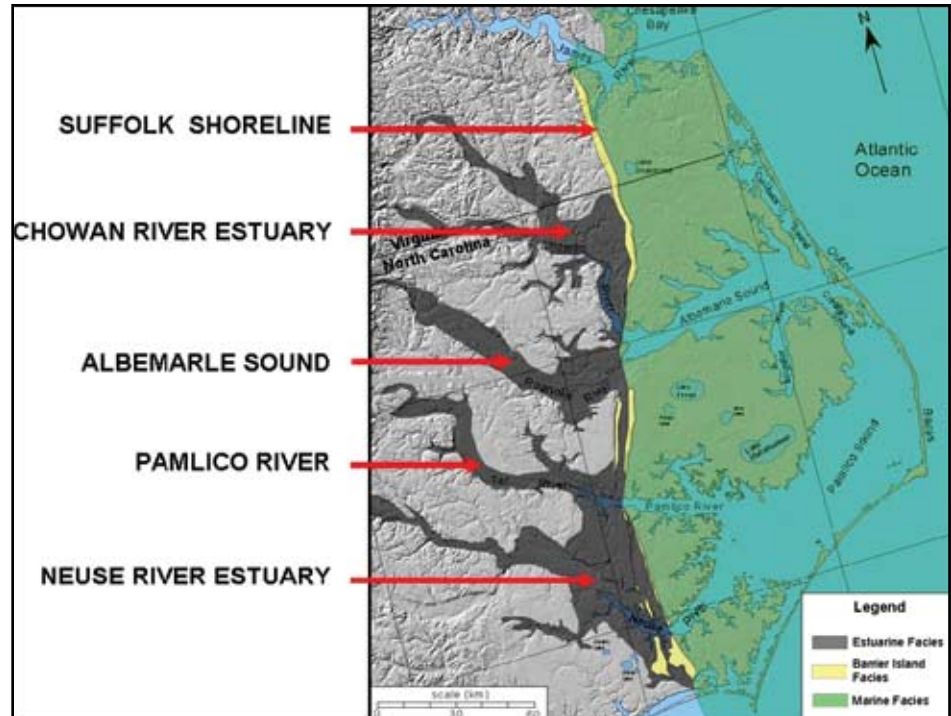


FIGURE 3. This map (based upon LiDAR data) reconstructs the ocean shoreline (Suffolk shoreline) that was occupied during the interglacial sea-level high-stand about 125,000 to 80,000 years ago. Sea level was 20 to 25 feet higher than modern sea level and the entire area east of the Suffolk shoreline was flooded. The associated drowned-river estuaries, like those of today, occurred west of the shoreline. The modern shoreline, estuaries and sounds are shown for geographic reference but they did not exist at the time represented by this map. Figure is modified from P. Parham (unpublished).

We are presently in an interglacial episode characterized by rising sea level. If global warming continues and substantial portions of the Greenland and/or Antarctic ice sheets were to collapse, the ocean shoreline of North Carolina would move significantly inland of the present coast. This occurred during the last interglacial sea-level highstand, 125,000 to 80,000 years ago, when the ocean was 20 to 25 feet above today's sea level and it occupied the Suffolk Shoreline some tens of miles west of the present shore (Fig. 3).